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Maternal health literacy and prevention of acute respiratory infection in toddlers

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Abstract

Background: Acute Respiratory Infection (ARI) is one of the leading causes of infant mortality worldwide, especially in developing countries. Lack of health literacy among mothers of toddlers is one factor that worsens the early treatment of ARI.

Purpose: To determine the effectiveness of leaflet-based communicative counseling in improving the health literacy of mothers of toddlers to prevent ARI.

Method: The research design was a quantitative pre-experimental study with a one-group pretest-posttest design. The sample in this study was all mothers of 31 toddlers detected with ARI, selected using a total sampling technique. The research instrument was a valid and reliable questionnaire used to measure maternal knowledge before and after the intervention.

Result: The results showed a significant increase in maternal knowledge after counseling ($p = 0.000$).

Conclusion: This indicates that leaflet-based communicative counseling is efficacious in improving the health literacy of mothers of toddlers. It is recommended that health workers at community health centers routinely provide similar counseling.

Keywords: ARI (Acute Respiratory Infection); Communicative Counseling; Health Literacy; Leaflet Media; Toddlers.

INTRODUCTION

In today's modern era, children's health problems are still dominated by cases of Acute Respiratory Tract Infections (ARTIs), disorders that can affect both the upper and lower respiratory tract. Acute Respiratory Tract Infections (ARTIs) remain a common disease and can cause serious complications if not properly managed (Setiawan, 2024). Acute Respiratory Infections (ARI) remain a major global health problem. Global data shows that each year, Acute Respiratory Tract Infections (ARTIs) cause the deaths of approximately 2.200 children daily, equivalent to 100 children per hour and 1 child every minute. This figure makes Acute Respiratory Infections (ARTIs) the leading cause of death in

children globally compared to other types of infections (Tuloli, Akuba, Djuwarno, Makkulawu, & Ahmad, 2024).

The Ministry of Health of the Republic of Indonesia (2020) identified that developing countries still face severe public health challenges, including Acute Respiratory Tract Infections (ARTIs). It is estimated that toddlers experience Acute Respiratory Tract Infections (ARTIs) three to six times per year. This disease is also a primary reason people visit healthcare facilities, accounting for approximately 40% to 60% of visits to community health centers and 15% to 30% of visits to outpatient and inpatient hospital services (Rustam, 2025).

Data from the Lampung Provincial Health Office in 2023 reported that the number of cases of Acute Respiratory Tract Infection (ART) reached 31,462, with 16,102 cases in boys and 15,360 in girls. The South Lampung Regency Health Office also reported that 377 cases of Acute Respiratory Tract Infection (pneumonia) were recorded between January and November 2023. The details of cases per month are as follows: January: 17 cases; February: 19 cases; March: 15 cases; April: 14 cases; May: 12 cases; June: 11 cases; July: 16 cases; August: 9 cases; September: 75 cases; October: 104 cases; and November: 85 cases. In addition, the number of cases of non-pneumonia Acute Respiratory Tract Infections during the same period reached 15,553 cases. The distribution of cases per month is: January 675, February 703, March 564, April 626, May 506, June 588, July 512, August 704, September 4,514, October 3,938, and November 2,223. In March 2025, the percentage of Acute Respiratory Tract Infection cases at the Bumidaya Inpatient Unit in South Lampung was 1.86% of the 2,576 toddlers diagnosed with Acute Respiratory Tract Infections (Lampung Provincial Health Office, 2025).

Several previous studies have shown that maternal knowledge significantly influences efforts to prevent Acute Respiratory Tract Infections in toddlers. There was a significant relationship between maternal knowledge, attitudes, and behaviors related to preventing Acute Respiratory Tract Infections in toddlers at the Telaga Dewa Community Health Center in Bengkulu (Palingga, Wulandari, & Aprianti, 2025).

A comparison of health education using the snowballing method and lectures on maternal knowledge regarding the management of Acute Respiratory Tract Infections in toddlers at the Totoli Community Health Center, Majene Regency, showed that the level of knowledge of the intervention group before receiving health education using the snowballing method was in the moderate category (38.8%). Meanwhile, the level of knowledge of the control group before receiving health education using the lecture method was in the poor category (50.0%). After receiving health education through the snowballing method, the intervention group improved

to the good category (66.7%) (Sastriani, Yuliani, & Wardina, 2025).

Maternal health literacy regarding Acute Respiratory Tract Infections plays a crucial role in preventing this disease in toddlers. Mothers with good health literacy will more easily understand information about Acute Respiratory Tract Infections, including risk factors, early signs and symptoms, and preventative measures that can be taken at home. Good literacy also enables mothers to filter health information appropriately and apply it to clean and healthy lifestyles to protect their children from the risk of Acute Respiratory Tract Infections. Health literacy encompasses knowledge of health and health services, the ability to process and use health information, and skills for maintaining overall health (Mutiar, Sitoayu, Dewanti, & Fanani, 2024).

Good health promotion media is media that can provide health information appropriate to the target audience's level of acceptance, so that they are willing and able to change their behavior in accordance with the messages in the lecture on Acute Respiratory Tract Infections (Sidabutar & Waruwu, 2022).

RESEARCH METHOD

This study employed a quantitative approach. The method employed was a pre-experimental cross-sectional design, specifically a One Group Pretest-Posttest design. In this pre-experimental approach, researchers, students in the public health program, conducted communicative counseling and measured mothers' knowledge of toddlers' prevention of Acute Respiratory Tract Infections (ARTs).

This study aimed to determine the increase in mothers' knowledge regarding the prevention of Acute Respiratory Tract Infections (ARTs). This study was conducted in May 2025 at the Bumi Daya Inpatient Community Health Center (UPTD) in South Lampung Regency. The study population comprised 31 mothers of toddlers with Acute Respiratory Tract Infections (ARTs) at the Bumi Daya Inpatient Community Health Center (UPTD). The sampling method employed was total sampling, in which the entire population was sampled.

The data collection instrument for this study was a questionnaire that measured mothers' health

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literacy regarding the prevention of Acute Respiratory Tract Infections (ARTs). The survey instrument consisted of questions designed to assess mothers' understanding of pneumonia and their actions to prevent this disease in toddlers. This instrument uses a 15-question questionnaire about mothers' knowledge of pneumonia. Each item is scored 1 if the mother answers correctly and 0 if the answer is incorrect. The total maternal knowledge score is obtained by summing all scores across the 15 items.

A pre-test was conducted to determine the initial level of health literacy and preventive measures for Acute Respiratory Tract Infections (ART) in toddlers before the intervention. Following the pre-test, researchers provided health education related to the prevention of Acute Respiratory Tract Infections (ART) in toddlers. The education was delivered twice, in person and through prepared educational materials, such as leaflets and other visual aids. A post-test was

administered after the education was completed. The post-test aimed to measure changes in mothers' knowledge and preventive measures for ART following the intervention.

Data collected from the pre-test and post-test were then processed and analyzed. Data analysis was conducted to determine whether there were significant differences or improvements in health literacy and preventive measures for Acute Respiratory Tract Infections (ART) before and after the intervention. The results of the data analysis are presented in narrative and tabular form to facilitate interpretation and the drawing of conclusions regarding the effectiveness of counseling in increasing knowledge and promoting preventive measures for Acute Respiratory Tract Infections among mothers of toddlers at the Bumidaya Community Health Center.

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RESEARCH RESULTS

Table 1. Table 1. Frequency Distribution of Respondents (N=31)

Variable	Results
Age (Mean±SD) (Range) (Year)	(22.43±7.356) (25-46)
25-30	12/39.0
31-35	11/35.0
>35	8/26.0
Education (n/%)	
Elementary school	10/32.0
Junior High School	17/55.0
Senior High School	4/12.9
Knowledge Pre-Test (n/%)	
Good	13/42.0
Poor	18/58.0
Knowledge Post-Test (n/%)	
Good	0/0
Poor	31/100

Table 1 shows that the average age of respondents and standard deviation is (22.43±7.356) with an age range (25-46). The majority of respondents have a JHS Education Level, namely 17 respondents (55.0%) with the majority having poor knowledge during the pre-test, namely 18 respondents (58.0%) and the majority having good knowledge post-test, namely 31 respondents (100%).

Table 3. Paired Sample Test

Paired Data	Mean	Std. Devia	Std. Error Mear	t	df	Sig. (2-tailed)
Pretest-Posttest	-5.161	1.416	0.254	-20.287	30	0.000

The results of the Paired Sample T-Test obtained a significance value of 0.000 ($p < 0.05$). This indicates a statistically significant difference between the pre-test and post-test scores. The average pre-test score was 8.32, while the average post-test score increased to 13.48.

DISCUSSION

The results showed that the majority of respondents were of productive age (25–40 years), which is generally the age group of mothers with toddlers, a relevant group in the context of preventing Acute Respiratory Tract Infections. Most mothers still

had primary to secondary education. This level of education can influence their understanding and knowledge about preventing and treating Acute Respiratory Tract Infections in toddlers. This is in line with previous research that found that people with low levels of education tend to have lower levels of knowledge. The majority of mothers are housewives who spend most of their time at home with their children. This allows them to play a crucial role in the care and monitoring of their children's health, including in preventing Acute Respiratory Infections (Kamil, 2019)).

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All participants stated that they "know" about efforts to prevent Acute Respiratory Tract Infections, indicating a significant increase in knowledge after intervention or counseling. Effective counseling will build awareness and responsibility in individuals to continue developing, face challenges, and take advantage of existing opportunities in their personal, social, and professional lives (Adawiah, Asmini, Minarti, & Amriana, 2024). These results reflect the success of the health education program in increasing respondents' understanding of the importance of preventing Acute Respiratory Infections through healthy lifestyles and other preventive measures.

Preventive measures such as maintaining environmental cleanliness, reducing exposure to air pollution, practicing cough etiquette, and wearing masks are highly recommended to reduce the risk of transmission of Acute Respiratory Infections (Amalia, Fahdhienie, & Fadhlullah, 2024; Sepeh, Gudino, & Hala, 2024). Other studies also state that maintaining environmental quality and prioritizing children's overall health are important steps in preventing Acute Respiratory Infections. Mothers with higher levels of health literacy tend to take more appropriate preventive measures against Acute Respiratory Infections, including maintaining environmental cleanliness, providing adequate nutrition, and taking their children to health facilities when they show symptoms of Acute Respiratory Infections. A positive correlation was found between literacy levels and the accuracy of preventive measures (Nabila, Sari, & Hidayati, 2022; Sogara, Hinga, & Landi, 2024).

Mothers with higher levels of health literacy tend to take more appropriate preventive measures against Acute Respiratory Infections (ARI), such as maintaining environmental cleanliness, providing adequate nutrition, and immediately taking their children to a health facility when ARI symptoms appear. A positive trend was found between literacy levels and the accuracy of preventive measures. The higher the health literacy, the more effective the preventive measures implemented. This indicates that health literacy plays a crucial role in fostering awareness and practice of ARI prevention in toddlers. Early prevention and treatment of ARI is crucial to reduce the risk of serious complications, especially in

toddlers whose immune systems are still developing (Faizah & Anggraeni, 2023).

Therefore, researchers assume that even with low education levels, high maternal literacy can improve the prevention of ARI in toddlers. Previous research also stated that empowering mothers through nutrition and health education is a strategic step in improving the quality of children's growth and development during their critical growth period (Prajayanti, 2022). In addition, creating a clean and healthy living environment is beneficial not only for children but also for all family members (Suhada, Novianus, & Wilti, 2023).

CONCLUSION

Frequency Distribution of Maternal Health Literacy The level of maternal health literacy regarding acute respiratory infections (ARI) in toddlers shows quite striking variations, with the majority of respondents in the moderate to high literacy category. This indicates that most mothers have an adequate basic understanding of the symptoms, causes, and initial treatment of ARI. There is a relationship between maternal health literacy levels and preventive measures for ARI.

SUGGESTION

There is a need to increase community participation, especially among mothers, in outreach activities at integrated health posts (posyandu) and other educational forums to increase knowledge and awareness of how to prevent Acute Respiratory Tract Infections in toddlers.

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